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how much time has to be spent in the preparation of a single set, and what small material advantage can be derived from such undertakings.

Austin's name is well-known by the readers of the *BULLETIN*, to which he has furnished the descriptions of 110 species of Mosses and Hepaticae. Sixty-four others have been published in the *Botanical Gazette*.

As an anatomist and judge of the character of the Mosses, Austin had a quick perception, but was often disposed to unreliable conclusions, formed too confidently on incomplete materials. He has, therefore, sometimes recalled his first determinations. But who is the bryologist who has done otherwise? A large number of his species, some of them the finest and rarest in the North American Bryology, stand as wonders of his clear discrimination, and he leaves a name dear to American botanists and well-known to European bryologists.

The loss of Austin is especially to be regretted for Hepaticology, of which he was the only representative in this country. He had studied the Hepaticae as his specialty, with the purpose of publishing a Synopsis, which time only prevented him bringing to completion.

L.

[Mr. Austin left sets of his Musci, and Hepaticae, all labelled and accompanied by a catalogue and index. His private collection contains very numerous specimens of each species, with his notes upon their various forms in different localities. It would be an invaluable aid in making critical researches in this field of enquiry, and should be acquired by some scientific institution. Those who make a study of these subjects ought to be prompt in procuring sets, both for their own sakes and for the sake of the family of this devoted scientific worker. The prices are given in the advertising page of this sheet.]

§ 34. **The Genus *Pinus*.**—*Revision of the Genus *Pinus* and description of *Pinus Elliottii*, by Dr. George Engelmann*, from the Transactions of the Academy of Science of St. Louis, February, 1880, with three beautiful plates illustrating *P. Elliottii*, drawn on stone by P. Roetter.

With indomitable courage, patience and skill, Dr. Engelmann attacks one after another the Doubting Castles of Botany and generally succeeds, if not in utterly demolishing them, at least in opening to the light their most gloomy dungeons. Mr. Bebb will probably claim that *Salix* offers a more stubborn and more extensive obstacle than *Pinus*, but the latter was far enough from being reduced, before Dr. Engelmann sat down before it. It is claimed that the present arrangement is as natural a one as any that can be devised, and that by it, to some extent, even geographical alliances are best preserved.

Dr. Engelmann finds, "with Endlicher, the most valuable character in the fruit scale," or, to speak more correctly, "that the fruit scale in this genus corresponds with a series of other characters which constitute two very natural sections of the genus" *Strobos* and *Pinaster*. The more or less thickened exposed part of this scale, called the apophysis, is rather depressed and terminates in a blunt point in *Strobos*; in *Pinaster*, it bears its point on the usually more thickened back, the *umbo*, mostly armed with a prickle or spur, sometimes early deciduous.

The subsections are distinguished by the position of the resinous ducts within the leaf. These ducts, normally two, but very often numerous, lie amid the chlorophyll-bearing parenchyma cells, between the thick epidermis and the sheath which surrounds the vascular bundles. When close to the epidermis the ducts are called *peripheral*; surrounded on all sides by the parenchyma, *parenchymatous*; close to the sheath around the vascular bundles, *internal* ducts. The use of this position of the ducts is the main new point in the present classification. It is believed to be constant and intimately connected with the essential character of the plant. The difficulties attendant upon its use are: *first*, that "in some few species smaller accessory ducts do occupy an abnormal position; *secondly*, that "in pines with very slender leaves it is sometimes difficult to discover the ducts," and in some forms perhaps they are really absent, especially in cultivated specimens; and, *thirdly*, that sometimes the parenchyma separating them from the epidermis or vascular sheath is so thin a layer that *parenchymatous* ducts may be mistaken for *peripheral* or *internal*. The other distinctions though mostly more obvious are less natural, only the presence or absence of hypodermal or strengthening cells is difficult of appreciation and of doubtful value. We proceed to give a somewhat abridged account of the arrangement, but of course the students of pines will not be satisfied with less than the complete monograph with all its details. Dr. Engelmann includes only such species or (sub-species) as he has been able to examine himself: "the list, however, will be found nearly complete." The numbers prefixed to the species are additions of our own.

SECT. I. STROBUS.

§ 1. **Eustrobi.**—Ducts peripheral. Northern or mountain species of the Old and New World.

* Wings longer than the seed.

1. P. Strobis, 2. monticola, 3. excelsa, 4. Peuce, 5. parviflora, 6. Bonaparteana, 7. Ayacahuite, 8. Lambertiana.

** Wings much shorter than seeds.

9. P. flexilis, (10. albicaulis), 11. pygmaea.

§ 2. **Cembrae.**—Ducts parenchymatous—Europe and principally Asia.

12. P. Cembra, 13. Mandschurica, 14. Koraiensis.

SECT. II. PINASTER.

A. Ducts peripheral. a. Cones subterminal.

§ 3. **Integrifoliae.**—Leaves smooth-edged, their sheaths deciduous.—Western North America and Mexico.

* Cones short globose; scales unarmed; seeds large with a minute wing.—*Cembroides*.

15. P. Parryana, 16. cembroides, 17. edulis, 18. monophylla.